

**REMARKS**

Claims 1, 3, 4 and 6 through 29 and new Claims 30 through 32 are pending in the application.

Claim 1 has been amended to reflect advantageous food casings in which the coating permeates the reinforcement. Support for this amendment can be found in the Application-as-filed, for example in Claim 3.

Claim 1 has also been amended to reflect expedient embodiments in which the reinforcement consists essentially of the recited fabrics. Support for this amendment can be found in the Application-as-filed.

Claims 1, 25 and 27 have been amended to reflect that their recited weights are weight per unit area. Support for these amendments can be found in the Application-as-filed.

Claim 3 has been canceled, as its subject matter was incorporated into Claim 1.

Claim 25 has additionally been amended to reflect beneficial aspects in which the coating consists essentially of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional further natural and/or synthetic polymers, (iv) optional secondary plasticizer, (v) optional dye and/or pigments and (vi) if the protein is water-soluble then at least one compound which crosslinks the protein. Support for this amendment can be found in the Application-as-filed, for example on Page 5, lines 20 through 32, Page 7, lines 18 through 19; Page 9, lines 10 through 12; Page 8, line 21 and Page 8, lines 1 through 3.

Claim 25 has also been amended to reflect that the inventive coating may contain up to 5 % cellulosic in the form of filler. Support for this amendment can be found in the Application-as-filed, for example on Page 6, lines 27 through 30.

Claim 25 has further been amended to reflect advantageous embodiments in which the protein comprises gelatin or collagen. Support for this amendment can be found in the Application-as-filed, for example on Page 5, lines 26 through 27.

Claim 29 has been amended to depend from and conform to Claim 1, and to further reflect beneficial aspects in which the coating is applied to only an outside surface of the reinforcement. Support for this amendment can be found in the Application-as-filed, for example on Page 1, lines 1 through 15.

Claims 30 through 32 have been added to highlight advantageous embodiments of the invention and complete the record for examination.

Claim 30 is directed to expedient embodiments in which the reinforcement consists of fibrous paper. Support for Claim 30 can be found in the Application-as-filed, for example on Page 5, line 3.

Claim 31 is directed to advantageous embodiments in which the casing has an extension ranging between 0.1 and 5 % in the longitudinal and transverse directions and water permeability ranging from about 10 to 100 l/m<sup>2</sup>d at 40 bar. Support for Claim 30 can be found in the Application-as-filed, for example on Page 11, lines 7 through 10 and Page 10, line 34 through Page 11, line 1.

Claim 32 is directed to beneficial embodiments in which the food casing is inedible. Support for Claim 32 can be found in the Application-as-filed, as implicitly present within the embodiment on Page 13, lines 25 through 30, inter alia.

Reexamination and reconsideration of this application, withdrawal of all rejections, and formal notification of the allowability of the pending claims are earnestly solicited in light of the remarks which follow.

*Claim Objection*

Claims 1, 25 and 27 stand objected to over the recitation "weight" in " $\text{g/m}^2$ ". Applicants respectfully submit that the recited weights are a weight per unit area, as kindly suggested by the Examiner and recited in Claims 1, 25 and 27 as-amended. Applicants further respectfully make of record that density is defined as mass per unit volume. Accordingly, Applicants respectfully request withdrawal of the foregoing objection.

*Section 112 Rejection*

Claim 25 stands rejected over the recitation "film-former." Without addressing the merits of the rejection and solely to advance prosecution of the above-referenced case, Claim 25 has been amended to instead recite the term "protein comprises" in lieu of "film-former consists of."

As noted above, support for this amendment can be found in the Application-as-filed.

Accordingly, Applicants respectfully request withdrawal of the foregoing rejection.

*The Claimed Invention is Patentable*

*in Light of the Art of Record*

Claims 1, 3, 4, 6 through 8, 10 through 17 and 19 through 29 stands rejected over United States Patent No. 5,043,194 (US 194) to Siebrecht et al and WIPO Publication WO 98/34490, whose United States equivalent is United States Patent No. 6,902,783 (US 783). Claim 9 stands rejected over US 194 in view of United States Published Application No. 2002/0064580 (US 580) to Gord et al. Claim 18 stands rejected over US 194 in view of United States Patent No. 5,955,126 (US 126) to Jon et al.

It may be useful to briefly consider the invention before addressing the merits of the rejection.

Applicants respectfully reiterate that cellulosic food casings have long been known in the art. Processes by which to form cellulosic food casings generally involve extruding a solution of either viscose-cellulose or NMMO-cellulose. Unfortunately, the formation of cellulosic food casings is both expensive and environmentally challenging.

Altogether unexpectedly, Applicants have found food casings which can be produced simply, inexpensively, and in an environmentally friendly manner.

Applicants have more particularly determined that casings formed from fibrous web reinforcements that have been coated with a film-forming-protein composition can be produced simply and inexpensively. The inventive coatings, present on at least one side of said reinforcement, permeates the reinforcement, as recited in Claim 1 as-amended, providing superior bonding. The coating may optionally include up to a maximum of 5% by weight cellulosic filler. If the film-forming protein is water-soluble, the coating also incorporates at least one compound to crosslink the protein. Advantageously, the fibrous support web has a weight per unit area of 3 to 400 g/m<sup>2</sup>.

In especially beneficial aspects, the inventive coating consists essentially of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional further natural and/or synthetic polymers, (iv) optional secondary plasticizer, (v) optional dye and/or pigments and (vi) if the protein is water-soluble then at least one compound which crosslinks the protein, as recited in Claim 25 as-amended.

In particularly expedient embodiments, the reinforcement consists of fibrous paper, as recited in newly added Claim 30.

The inventive casings incorporating a protein-coated reinforcement also provide a highly beneficial balance of properties. The inventive casings advantageously exhibit an extension ranging between 0.1 and 5 % in the longitudinal and transverse directions and water permeability ranging from about 10 to 100 l/m<sup>2</sup>d at 40 bar, for example, as recited in newly added Claim 31.

Applicants respectfully reiterate that the cited references do not teach or suggest the claimed invention.

Applicants particularly respectfully reiterate that none of the cited references teaches or suggests casings formed from protein coated fabrics or papers, much less fabrics or papers having a weight of up to  $400 \text{ g/m}^2$ , as recited in Claim 1.. The cited references similarly fail to teach or suggest fibrous material having a weight of up to  $1000 \text{ g/m}^2$  that are coated with protein consisting of gelatin and/or collagen, as recited in Claim 25 as-amended.

US 194 is directed to cellulosic casings having a "decorative surface texture" that are produced via the conventional viscose process. (Col. 1, lines 55 – 65; Col. 4, lines 25 – 27 and 61 through 64 and Col. 6, lines 1 - 2). The decorative surface texture is imparted by a "textile sheet-shaped structure," defined as either a woven fabric, scrim or knitted fabric. (Col. 2, lines 40 – 45 and 54 - 56). Woven fabrics and scrims are defined as having at least two thread systems crossing each other at right angles. (Col. 2, lines 45 – 46). Knit fabrics are defined as being formed from meshes having a polygonal form. (Col. 2, lines 48 – 51). The textile is disposed in such a way that the woven or knitted texture is visible on the outer surface of the casing. (Col. 2, lines 57 – 60). US 194 notes that that its textile structure may be coated on both sides. (Col. 2, line 63 – 64). US 194 indicates that the outer cellulose layer is thinner than the inner cellulose layer, with a recommended thickness ratio of up to 1 to 9. (Col. 3, lines 66 – Col. 3, line 2). The working examples of US 194 are coated on both sides with viscose cellulose. (Col. 5, lines 40 – 45 and Col. 5, lines 60 – 65).

US 194, directed solely to cellulose casings formed via the viscose cellulose process, does not teach or suggest the inventive casings in which protein permeates the reinforcement, as recited in Claim 1 as-amended. Applicants respectfully submit that to modify US 194 so as to avoid its viscose process would altogether change the principle of operation for US 194.

And US 194 most certainly does not teach or suggest the inventive coatings consisting essentially of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional further natural and/or synthetic polymers, (iv) optional secondary plasticizer, (v) optional dye and/or pigments and (vi) if the protein is water-soluble then at least one compound which crosslinks the protein, much less such coatings applied uniformly to fibrous material, as recited in Claim 25 as-amended.

US 194 likewise fails to teach or suggest beneficial aspects in which the coating is applied to only an outside surface of the reinforcement, as recited in Claim 29 as-amended. US 194 instead teaches away from such embodiments, by suggesting that any outside casing coating must be thin enough to allow its textile to be seen and further indicating that an outside coating is only applied in conjunction with a thicker inside coating.

Nor does US 194, requiring a woven, scrim or knit fabric, teach or suggest inventive casings incorporating reinforcement consisting of fibrous paper, as recited in newly added Claim 30. Applicants further respectfully submit that to modify US 194 so as avoid its required woven, scrim or knit textile structure would render it unfit for its intended purpose as a "decorative" sausage. Applicants alternatively respectfully urge that there would have been no motivation to have formed a casing incorporating reinforcement consisting of fibrous paper in light of US 194 as there would have been no expectation of success in producing a "decorative" sausage.

US 194 similarly fails to teach or suggest that inventive casings formed from a protein-coated reinforcement would exhibit both an extension ranging between 0.1 and 5 % in the longitudinal and transverse directions and water permeability ranging from about 10 to 100 l/m<sup>2</sup>d, as recited in newly added Claim 31.

Accordingly, Applicants respectfully submit that US 194 does not teach or suggest the claimed invention.



Applicants respectfully submit that US 783 likewise fails to teach or suggest the inventive casings.

Applicants respectfully reiterate that US 783 is directed to extruded, edible films, i.e., “edible shaped bodies,” formed from a thermoplastic composition that includes biopolymers, such as thermoplastic starch. (Col. 1, lines 37 through 40; Col. 1, lines 52 – 67; Col. 2, lines 38 – 41 and Col. 4, lines 26 - 30). The thermoplastic composition includes biopolymer, plasticizer, crosslinker, and at least one lubricant. (Col. 1, lines 57 – 60). Suitable lubricants include vegetable oils, such as sunflower seed oil, or lecithins. (Col. 3, lines 5 – 7). The lubricant, present in amounts of up to 30 % by weight, renders the thermoplastic composition “soft and flowable.” (Col. 3, lines 10 – 11 and Col. 4, lines 7 - 9).

The casings of US 783 are extruded through a ring die followed by blowing or are extruded through a slit-shaped die followed by stretching. (Col. 2, lines 18 – 23 and Col. 4, lines 26 – 29). The stretching or blowing step imparts mechanical strength to the shaped body. (Col. 2, lines 28 – 30). US 783 expressly teaches that “[c]ollagen is unsuitable” as a biopolymer. (Col. 2, lines 52 – 53). To further strengthen the films, the biopolymer blends may further include wood pulp or the like within its extrudable mass, presumably in edible quantities. (Col. 3, lines 44 – 46). Although the vast majority of working examples do not include wood pulp, Example 1 does include such fibers within its extrusion blend. (Col. 5, lines 1 – 18) The wood pulp fibers of US 783 are very short, having a length of at most 5 mm, preferably at most 2 mm. (Col. 3, lines 48 – 50). In the shaped body, the short fibers are homogeneously distributed. They do not form a coatable structure at any time. As correctly noted by the Examiner, the films of US 783 are indicated to have “low liquid - ... permeability.” (Col. 5, lines 33 – 35).

Applicants respectfully reiterate that US 783, solely directed to extruded films, does not teach or suggest the claimed food casings formed from coated reinforcement. Applicants respectfully submit that to modify US 783 so as to avoid its extrusion process would altogether change its principle of operation. Applicants further respectfully submit that polymer compositions suitable for extrusion may not merely be “applied as a coating,” and that the

urgings of the outstanding Office Action on Page 10, Ref. No. 25 in that regard are merely a conclusory statement. Applicants respectfully submit that, inter alia, the rheological properties of polymer compositions suitable for extrusion versus coatings are altogether different.

Applicants additionally respectfully reiterate that US 783 thus cannot teach or suggest such inventive casings incorporating coated reinforcement consisting essentially of the recited fabrics and paper, as recited in Claim 1 as-amended. Applicants respectfully submit that US 783 instead merely indicates that its biopolymer blends may further include wood pulp. Applicants further respectfully submit that to modify US 783 so as to incorporate the recited fabrics or paper would clearly render it unfit for its intended purpose as an edible sausage casing. Hence there would have been no motivation to have done so.

And US 783 most certainly does not teach or suggest the inventive coatings consisting essentially of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional further natural and/or synthetic polymers, (iv) optional secondary plasticizer, (v) optional dye and/or pigments and (vi) if the protein is water-soluble then at least one compound which crosslinks the protein, as recited in Claim 25 as-amended. Applicants respectfully submit that to modify US 783 so as to avoid its required lubricant would render it unfit for its intended purpose. Applicants additionally respectfully submit that there would have been no motivation to have eliminated the lubricant of US 783, as the lubricant is said make the resulting compositions "soft and flowable," hence there would have been no expectation of success as an extruded film (or for that matter, coating) in its absence.

US 783 likewise fails to teach or suggest such inventive casings incorporating coated reinforcement consisting of fibrous paper, as recited in newly added Claim 30. As noted above, there would have been no motivation to have formed the advantageous embodiments of US 783, as there would have been absolutely no expectation of success in forming the required edible casing.



US 783 similarly fails to teach or suggest that casings formed from protein coated reinforcement would exhibit an extension ranging between 0.1 and 5 % in the longitudinal and transverse directions and water permeability ranging up to 100 l/m<sup>2</sup>d, as recited in newly added Claim 31. US 783 instead indicates that its extruded films have a low liquid-permeability.

US 783 also fails to teach or suggest the inedible casings of newly added Claim 32. US 783 instead teaches away from such embodiments by clearly requiring that its casings be edible. In fact, Applicants respectfully submit that to modify US 783 so as to form inedible films would clearly render it unfit for its intended purpose.

Accordingly, Applicants respectfully reiterate that the claimed invention is patentable in light of US 783, considered either alone or in any combination with the remaining art of record.

There would have been no motivation to have combined US 194, directed to casings formed via the viscose process, and US 783, directed to edible casings formed by thermoplastic extrusion. Applicants respectfully submit that casings suitable for one application will not automatically work in another application, as each application has its own unique requirements. Therefore, a casing for one application may not suggest a solution for another application.

However, even if Applicants had combined US 194 and US 783 (which Applicants did not do), the claimed invention would not have resulted.

The combination simply does not teach or suggest the inventive casings in which protein permeates the reinforcement, as recited in Claim 1 as-amended. US 194 is directed solely to cellulose casings formed via the viscose cellulose process, while US 783 is solely directed to extruded films. Applicants respectfully submit that conjectural "laminates" formed by combining the extruded films of US 783 with US 194, as urged within the outstanding Office Action on Page 7, Ref. No. 17, would be expected to have adhesive joining laminate layers, rather than the recited protein permeating the reinforcement. As noted above, Applicants respectfully submit that polymer compositions suitable for extrusion may not merely be "applied

as a coating,” and that the urgings of the outstanding Office Action on Page 10, Ref. No. 25 to the contrary are purely conjecture.

The combination thus does not teach or suggest inventive casings incorporating coated reinforcement, as further recited in Claim 1 as-amended. US 783 at best merely indicates that its extrudable mass may further include wood pulp.

And the combination most certainly does not teach or suggest the inventive coatings consisting essentially of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional further natural and/or synthetic polymers, (iv) optional secondary plasticizer, (v) optional dye and/or pigments and (vi) if the protein is water-soluble then at least one compound which crosslinks the protein, much less such coatings applied uniformly to the fibrous material, as recited in Claim 25 as-amended. Applicants respectfully submit that there would have been no expectation of success in forming suitable protein coatings in the absence of US 783’s required lubricant. US 194, directed solely to cellulose casings, does not cure this deficiency.

The combination likewise fails to teach or suggest that the inventive food casings formed from protein-coated reinforcement having a weight per unit area of 10 to 200 g/m<sup>2</sup> would exhibit a water vapour permeability of up to 1500 g/m<sup>2</sup>d, determined via DIN 53 122, as recited in Claim 27. Applicants respectfully submit that the Office Action’s urgings on Page 11, Ref. No. 27 that the inventive casings may be made “porous” to have imparted water vapour permeability are purely conclusory. Particularly, Claim 27 is directed to fabric or paper onto which a protein-based coating is “uniformly applied.” Consequently, the incorporation of “porosity” to elevate water vapour permeability, as urged within the outstanding Office Action on Page 11, Ref. No. 27, is purely a conjectural statement.

The combination similarly fails to teach or suggest that casings formed from a protein-coated reinforcement would exhibit an extension ranging between 0.1 and 5 % in the longitudinal and transverse directions and have a water permeability ranging up to 100 l/m<sup>2</sup>d, as recited in newly added Claim 31. US 194, directed solely to cellulosic films, does not teach or suggest the extensibility or water permeability of protein-based casings. US 783 does not cure this deficiency, instead indicating that its films have a low liquid-permeability.

And the combination cannot teach or suggest expedient embodiments in which the casing reinforcement consists of fibrous paper, as recited in newly added Claim 30. US 194 clearly requires the presence of a woven, knit or scrim fabric, while US 783 merely suggests the incorporation of wood pulp. Applicants further respectfully submit that to conclude otherwise would be to engage in an impermissible hindsight analysis.

The combination also fails to teach or suggest the inedible casings of newly added Claim 32.

Accordingly, Applicants respectfully submit that US 194 and US 783 do not teach or suggest the claimed invention, considered either alone or in combination.

Claim 9 is likewise patentable in light of US 580.

As correctly noted by the Examiner, US 580 is directed to cellulose-based food casings, particularly cellulose-based food casings obtained in an amine oxide process. [0017]. In the process, a solution of cellulose in a monohydrate of N-methyl-morpholine-N-oxide (NMMO) is prepared, a surface-modifying additive and an internal-structure-changing additive are added to the solution and the mixture is then shaped into a tubular casing. [0013 and 0027]. The surface-modifying additive may be selected from any of a generic list, including paraffin, and is present in amounts as low as 0.2 % by weight . [0014 and 0020] The structure-modifying agent may similarly be selected from any of a generic list, including polyester and fatty acids. [0021] The

cellulose-based casings of US 580 include at least 50% by weight of cellulose or cellulose derivatives. [0018]

US 580, directed to cellulose casings incorporating any of a number of structure-modifying additives, does not teach or suggest the inventive protein-based coatings, as recited in the claimed invention. Nor would there have been any expectation that the structure-modifying additives of US 580, incorporated into NMMO-cellulose compositions, would be compatible with the recited protein-based coatings.

US 194 and US 783 do not teach or suggest the claimed invention, based upon the reasoning provided above.

There would similarly have been no motivation to have combined US 194, US 783 and US 580. However, even if Applicants had combined US 194, US 783 and US 580 (which Applicants did not do), the claimed invention would not have resulted.

This combination similarly does not teach or suggest the inventive casings in which protein coating permeates the reinforcement, as recited in Claim 9 as-amended. US 194 is directed solely to cellulose casings formed via the viscose cellulose process. US 580 is directed to cellulose casings formed via an NMMO cellulose process. US 783 is solely directed to extruded films.

And the combination most certainly does not teach or suggest the inventive casings in which a protein-based coating permeating the reinforcement contains further natural or synthetic polymer selected from a poly-acrylate, polyvinyl acetate and/or a (co)polymer having units of vinyl acetate and/or units of saponified vinyl acetate (vinyl alcohol), as recited in Claim 9. US 580 merely provides a generic list of structure-modifying additives, such as polyester, that may be incorporated into a cellulosic composition.

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of US 194, US 783 and US 580, considered either alone or in any combination.

Claim 18 is similarly patentable in further light of US 126.

US 126 is directed to self-coloring food casings, which may be formed from either cellulose or any of a number of synthetic polymers, with regenerated cellulose casings being preferred. (Col. 10, lines 18 - 38). The impetus of US 126 is the formation of a colorant coating that has a "preferential substantivity" to proteinaceous foodstuffs. (Col. 8, lines 13 - 16). The casings of US 126 incorporate a transferable coating that contains a bixin colorant. (Col. 9, lines 8 - 11). The transferable colorant coating further includes a soluble film-forming agent selected from any of a generic list of materials, with cellulose ether preferred. (Col. 8, lines 16 - 23). US 126 expressly notes that moisture solubilizes the film forming agent, thereby releasing the bixin dye pigment during subsequent processing. (Col. 12, lines 55 - 62). In fact, the soluble film forming agent is noted on several occasions as performing a transfer/release function for the colorant. (Col. 13, line 65 - Col. 14, line 2). Applicants respectfully submit that the film forming agent thus remains soluble over the life of the casing to perform its required release of bixin.

Applicants respectfully submit that US 126, directed to conventional food casings having a color transfer coating, does not teach or suggest the inventive casings food casings formed from a protein-coated reinforcement.

US 194 and US 783 do not teach or suggest the claimed invention, based upon the reasoning provided above.

There would similarly have been no motivation to have combined US 194, US 783 and US 126. However, even if Applicants had combined US 194, US 783 and US 126 (which Applicants did not do), the claimed invention would not have resulted.



The foregoing combination particularly fails to teach or suggest the inventive casings in which protein permeates the reinforcement, as recited in Claim 18 as-amended. The coatings of US 126 are instead intended to transfer to a proteinaceous foodstuff. As noted above, US 194 and US 783 do not overcome this deficiency.

And the combination most certainly does not teach or suggest the inventive coatings containing either insoluble protein or water-soluble protein and at least one compound which crosslinks the water-soluble protein, as further reflected in Claim 18. US 126 clearly requires its film forming agent to remain soluble over the life of the casing, regardless of any disclosure it may contain as to conventional barrier layers. Applicants respectfully reiterate that to modify US 126 so as to eliminate the required solubility of the film former would render US 126 unfit for its intended purpose as a color transfer casing, thus its combination with the remaining art of record is improper.

Accordingly, Applicants respectfully submit that Claim 18 is similarly patentable in light of US 194, US 783 and US 126, considered either alone or in any combination.

### **CONCLUSION**

It is respectfully submitted that Applicants have made a significant and important contribution to the art, which is neither disclosed nor suggested in the art. It is believed that all of pending Claims 1, 4 and 6 through 32 are now in condition for immediate allowance. It is requested that the Examiner telephone the undersigned if any questions remain to expedite examination of this application.

It is not believed that extensions of time or fees are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time and/or fees are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required is hereby authorized to be charged to Deposit Account No. 50-2193.



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Respectfully submitted,



Cathy R. Moore

Reg. No. 45,764

ProPat, L.L.C.

425-C South Sharon Amity Road

Charlotte, NC 28211-2841

Telephone: (704) 365-4881

Fax: (704) 365-4851

Customer No. 38263

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/Claire Wygand/

Claire Wygand